

Water Conservation Field Services Program

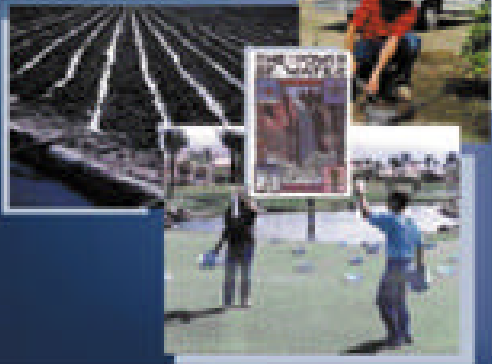
1998 Annual Report

Lower Colorado Regional Office



Yuma

Lower
Colorado



Southern California

Phoenix

Water Conservation Field Services Program

Bureau of Reclamation - Lower Colorado Region

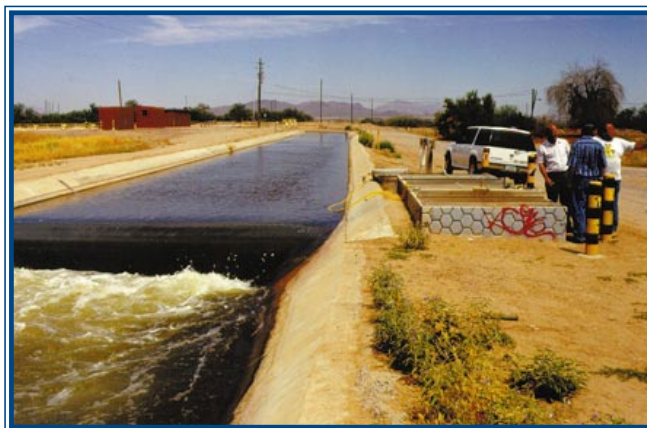
The mission of the Bureau of Reclamation is to manage, develop, and protect water and related resources in an environmentally and economically sound manner in the interest of the American public.

What is Reclamation's Water Conservation Field Services Program ?

The Water Conservation Field Services Program (WCFSP) was implemented by the Bureau of Reclamation (Reclamation) in fiscal year 1997 to actively encourage water conservation, assist water



users with their responsibility to develop and implement water conservation plans, and complement and support State and other conservation programs for the purpose of improving the management of water resources. The WCFSP was designed to implement the Preferred Alternative in Reclamation's March 1996 Final Environmental Impact Statement on implementation of the Reclamation Reform Act of 1982. It is intended to fulfill Reclamation's legal responsibility under Section 210 (a) of the act to "encourage" water conservation and to assist water users in meeting their obligation to develop water conservation plans under Section 210 (b). Its primary objective is to provide incentives through technical and financial assistance to water users to foster the efficient use and conservation of western water supplies.



The WCFSP provides an opportunity to develop partnerships which encourage conservation through: (1) Conservation Planning Assistance; (2) Conservation Information and Education; and (3) Conservation Demonstration and Implementation. For the purposes of the WCFSP, conservation means "efficient use", not merely "saving water for other purposes."

Authority

The principal statutory authority, providing the basis for the WCFSP, is the Reclamation Reform Act of 1982 (RRA), Section 210 (P.L. 97-293).

- Section 210(a) of the RRA requires the Secretary of the Interior to encourage water users to adopt water conservation measures.
- Section 210(b) of the RRA requires each water user who has a water service contract with Reclamation to develop and implement a water conservation plan containing: (1) definite goals; (2) appropriate water conservation measures; and (3) a time schedule for meeting the water conservation goals.

- Section 210(c) of the RRA directs the Secretary of the Interior to coordinate with and involve others, such as States, Indian Tribes, and water user organizations to assure full public participation in water conservation efforts.



In addition, Part 417 of Title 43, Code of Federal Regulations, directs Reclamation's Lower Colorado Region (Region) to consult with Colorado River water users on an annual basis regarding water conservation and reasonable, beneficial uses of Colorado River water.

Water Conservation Plans

Through the WCFSP, Reclamation is authorized to provide assistance to water users to aid in the development and implementation of sound conservation plans. Under existing Reclamation policy, conservation plans are to be developed or updated and submitted to Reclamation on a 5-year schedule. Each Area Office is assigned a WCFSP Coordinator who has technical and financial resources to help

ensure the timely submission and implementation of plans by users in their areas. While Reclamation does not approve plans, it has the responsibility to review and comment on plans to ensure that sound water conservation plans are adopted by districts.

Exceptions

Reclamation law states that all water users who have entered into a water service contract with Reclamation are required to submit conservation plans. There are three exceptions to this stipulation:

- (1) Users who receive fewer than 2,000 acre-feet (AF) of water per year from any Federal project
- (2) Users who serve a population of fewer than 3,300 people; and
- (3) Users that have prepared water conservation plans, or are meeting alternative standards, for other Federal or State agencies, that fulfill the intent of Section 210(b) of the RRA, as determined by the Regional Director.

Recommended Content of Plans



Reclamation recommends that a plan contains information insufficient detail to identify and evaluate the district's water management issues and opportunities for improvement in water use efficiency. The level of detail contained in a plan should be commensurate with each district's individual situation, size, and complexity and should support a district's decision as to which water conservation measures it will implement.

Water conservation measures are those methods, techniques, policies, practices, procedures, activities, institutional arrangements, structural projects, physical facilities, equipment, or devices which reduce water consumption, reduce water withdrawal or diversion, reduce water loss or waste, improve water use efficiency, or increase water recycling or reuse.

Reclamation recommends nine elements for inclusion in a district's water conservation plan. Reclamation views these elements as representative of the primary components of an effective water management and conservation planning process. This approach is intended to support formulation of water conservation goals, identification of appropriate and economically feasible conservation measures to meet those goals, and development of a time schedule for implementation. The nine elements recommended for inclusion in conservation plans are as follows:

- ▼ Description of the district
- ▼ Inventory of water resources
- ▼ Water management problems, opportunities, and goals
- ▼ Existing water conservation measures
- ▼ "Fundamental" water conservation measures
- ▼ Additional water conservation measures
- ▼ Selected measures and projected results



- ▼ Environmental review
- ▼ Implementation schedule and budget.

The "fundamental" water conservation measures are something that each district determines based on individual needs and situations. Reclamation recommends that these measures address (1) water measurement and accounting; (2) water pricing; (3) information and education; and (4) the designation of a contact person responsible for conservation activities.

Plans are very much living documents, and Reclamation encourages water users to revise or

update their plans throughout the 5-year implementation period as districts' needs, situations, goals, priorities, and expectations may change.

Making Plans Work

The other two components of the WCFSP (development and implementation of strong information and education programs and demonstration and implementation of innovative conservation technologies) are most commonly met by implementing conservation plans once they are in place.



As mentioned earlier, Reclamation law states that plans are to contain definite goals, appropriate conservation measures to implement the goals (Best Management Practices (BMP's) of plans), and a 5-year time schedule for meeting the plan's goals. This helps ensure that the development of plans is not merely a paper exercise but a realistic method for achieving the goals of the district. WCFSP Coordinators for each Reclamation Area Office have resources available to provide technical and/or financial assistance to help water users develop their 5-year plans and implement the goals and measures contained within those plans.

Lower Colorado Regional Office

The Lower Colorado Regional Office area covers the a vast amount of area in the Southwest area of the United States. The boundaries include the states of Arizona, Nevada, and Southern California. The **Phoenix Area Office** represents central and south-eastern Arizona, which encompasses the major metropolitan areas of Phoenix and Tucson, along with many rural and agricultural communities. The topography varies from heavily forest mountains on the Mogollon Rim to the low lying desert in the cen-

tral and southern portions of the state. The **Lower Colorado Regional Office Area** covers the upper half of the Lower Colorado Region, which includes the Colorado River and tributary areas from Lees Ferry to Davis Dam, with the exception of the Little Colorado River drainage. The tributary areas include portions of Utah southern Nevada, and northwestern Arizona. The **Yuma Area Office** administers the lower Colorado River, including all diversions below Davis Dam, except the Central Arizona Project and the Colorado River Aqueduct. Davis Dam and the Fort Mohave Indian Reservation mark the northern end of the area. The international border with Mexico establishes the southern boundary. The **Southern California Area Office** encompasses all of Southern California within the Lower Colorado Region, excluding the Colorado River, Imperial Valley, and Coachella Valley. This area has the seventh largest economy in the world, but is situated in a desert climate without enough fresh water locally to support the population and economy.



in fostering improved water management on a watershed basis in support of other Federal directives such as the Fish and Wildlife Coordination Act of 1958 and the Endangered Species Act of 1973.

The WCFSP has been established to actively encourage water conservation, assist water users with their responsibility to develop water conservation plans, and complement and support State and other conservation programs, particularly where improved water management can be fostered on a watershed basis.

While the program emphasis under RRA is to work with Reclamation projects, the

WCFSP is also designed to contribute to watershed partnerships outside of Reclamation projects to improve fish and wildlife habitat associated with water systems or water supplies affected by Reclamation projects.

Through the WCFSP, the Area Offices are providing technical and financial assistance to water users in areas of water management and conservation planning, conservation information and education programming, the demonstration of innovative con-

servation technologies, and the implementation of effective efficiency measures.

Purpose and Scope



The Water Conservation Field Services Program (WCFSP) is intended to fulfill Reclamation's legal responsibility under the Reclamation Reform Act of 1982 (RRA) to "encourage" water conservation of Reclamation projects, as well as broaden our partnerships with others

For the purposes of the WCFSP, the term "conservation" means "efficient use", and not merely "saving water for other purposes". It's about assisting districts, both urban and agricultural, manage their water more effectively. It's about measuring water to know how much is being diverted and delivered. It's about accounting for deliveries of water to know where and how it's being used. And, it's about encouraging efficient water management practices to maximize the beneficial use of diversions from reservoirs, streams and aquifers, while minimizing the environmental impacts to instream and other watershed resources.

The WCFSP is not intended as a replacement for other programs where Reclamation's overall goal is efficient water management - - but rather, it is intended to complement and augment them in terms

of providing a new field program strategy for conservation partnership and customer service.

Technical and Financial Assistance

Each Area Office has been challenged to develop a program the will:

- ◆ Provided technical and financial assistance to water users developing and implementing water conservation plans

- ◆ Establish collaborative efforts with users to encourage basinwide coordination in the planning, preparation, and implementation of water conservation plans

- ◆ Develop and provide users with planning guidance and other informational tools to assist in the development and implementation of water conservation plans

- ◆ Provide educational workshops and technical training opportunities for water users under water management and conservation planning and implementation



- ◆ Provide technical and financial assistance in demonstration and technology transfer of innovative conservation technologies

- ◆ Provide cost-sharing opportunities to encourage the implementation of effective water conservation and efficiency measures

- ◆ Ensure that Reclamation assistance programs support and complement existing State water conservation efforts

LOWER COLORADO REGIONAL AREA OFFICE

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Water Conservation Field Services Program

Bureau of Reclamation - Lower Colorado Region

Annual Report - FY1998

Lower Colorado Region Area

Location and Area of Responsibility

Reclamation's Lower Colorado Region consists of portions of California, Arizona, Nevada, Utah, and New Mexico. The Region contains four Area Offices whose responsibilities include working with the water users within individual Area Office boundaries to administer the WCFSP. The four Area Offices within the Region include the Lower Colorado Regional Area (LCRA), the Phoenix Area Office, the Southern California Area Office, and the Yuma Area Office.

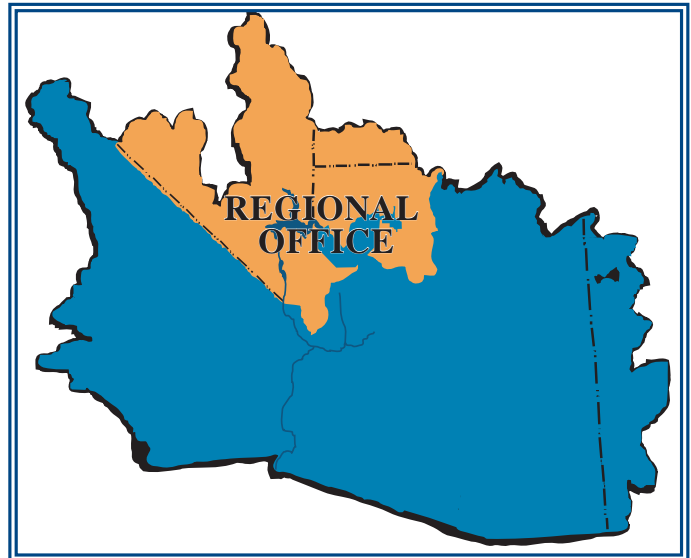
Entitlement to Colorado River Water

The seven Lower Basin States of California, Arizona, Nevada, Utah, New Mexico, Colorado, and Wyoming and the Republic of Mexico rely on the Colorado River to meet their water supply needs. In 1922, the States entered into an interstate compact which included a provision for the equitable division and apportionment of Colorado River water.

The 1964 U.S. Supreme Court Decree in *Arizona v. California* established several additional dimensions to the apportionment of Colorado River water, including apportionments to the States of California, Arizona, and Nevada. It was ruled that of the first 7.5 million AF of mainstem water consumed in the Lower Basin, California was entitled to a consumptive use of 4.4 million AF/year; Arizona to 2.8 million AF/year; and Nevada to 0.3 million AF/year.

The Colorado River Basin Project Act of 1968 authorized the Central Arizona Project, providing for allocations to the Lower Basin States in years of insufficient mainstream water to satisfy the specified consumptive use of 7.5 million AF/year.

In 1995, water users utilized the full 7.5 million AF/year allocation, providing all stakeholders with



significant incentive for further implementation of prudent water management.

Water Supply and Use Within the LCRA

The vast majority of water use in the LCRA is municipal and industrial (M&I), with little agricultural use in the tributary areas of the Colorado River. Most of the M&I water use is concentrated in the Las Vegas metropolitan area, the largest urbanized area within the LCRA boundaries. Other municipalities within the LCRA include St. George (Utah), Kingman, Lake Havasu, and Bullhead City (Arizona), who rely on groundwater and tributary flows of the Colorado River.

The agricultural farm lands (fewer than 100,000 acres) within the LCRA are irrigated with tributary flows and are not direct diverters of Colorado River water.

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Local Problems and Issues

Most of the issues surrounding WCFSP administration in the LCRA pertain to southern Nevada. Nevada is the driest state in the nation as well as one of the fastest-growing states (current figures show that 5,000 people move to southern Nevada each month), with a population of over 1 million people and a limited water supply of 300,000 AF/year to meet the needs of its residents. The majority of Nevada's Colorado River entitlement is diverted to southern Nevada, providing between 80 and 90 percent of its water supply, which is supplemented with local groundwater supplies totaling over 45,500 AF/year.

Local problems and issues at the forefront of community awareness include securing a sustainable water supply for southern Nevada as it quickly approaches its Colorado River entitlement. Negotiations are currently taking place among the Lower Basin States of California, Arizona, and Nevada which could enable Nevada to bank water in Arizona for future use.

Another local issue stems around the fact that 80 to 90 percent of Nevada's water supply is utilized in southern Nevada. Northern Nevada is concerned that, as southern Nevada's population continues to grow at such a rapid rate and the maximum entitlement of 300,000 AF/year is approached, southern Nevada will need more water within a few short years and may look to northern Nevada (who receives its water from sources other than the Colorado River) for additional water supplies.

Drainage problems exist in the Las Vegas valley due to the existence of a high groundwater table which threatens urban areas which must be controlled by drainage pumping. The high water table is aggravated by landscape irrigation. One potential solution, currently being discussed, is the prospect of adding new, expensive drainage wells and increasing drainage pumping.

Local Priorities, Goals, and Objectives

Nevada's water supply issues provide the framework for LCRA priorities, goals, and objectives. As Nevada continues to approach its annual Colorado River entitlement (in 1997, Nevada utilized 242,810 AF of water in consumptive use), many opportunities for conservation exist and continue to emerge. The priority for the LCRA is to first serve the needs of southern Nevada municipalities as they grapple with water management problems and opportunities. By working closely with the seven members of the Southern Nevada Water Authority (Las Vegas Valley Water District, the Cities of Las Vegas, North Las Vegas, Henderson, Boulder City, Big Bend Water District in Laughlin, and the Clark County Sanitation District) to put a comprehensive water conservation plan in place, we can concentrate on the areas of southern Nevada water use identified as needing the most attention with regard to conservation.

*Lower Colorado Regional Area**Location*

The LCRA boundaries are comprised of the upper half of the Region, which includes the Colorado River and tributary areas from Lees Ferry to Davis Dam, with the exception of the Little Colorado River drainage. The tributary areas include portions of southern Nevada, southern Utah, and northwestern Arizona.

Elevations range from 600 feet near Davis Dam to the mountain peaks of 12,000 feet above mean sea level near Las Vegas, Nevada. The average annual rainfall is very low for the majority of the LCRA, ranging from 200 millimeters (mm) or less in the lower desert areas to in excess of 800 mm in the mountains.

Vegetation, sparse throughout most of the LCRA due to low precipitation and warmer climactic conditions, consists mostly of typical desert plants. There are some forest areas in the LCRA; however, they are limited in size and are typically surrounded by desert terrain.

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Secondary Priorities, Goals, and Objectives

While southern Nevada poses the most pressing conservation needs of the LCRA, secondary priorities, goals, and objectives of the LCRA program include the needs of users in northwestern Arizona and southern Utah. Reclamation has tried to make itself more visible to the Arizona and Utah users in FY 1998 to plant the seed for future conservation partnering opportunities.

As a result, the LCRA was able to sponsor a landscape guide published exclusively for Mohave County residents and University of Arizona workshops. This guide is the first publication of its type in Mohave County, which contains watering guidelines

and planting specifications for vegetation exclusive to that community.

Our discussions with southern Utah led to discovery of a conservation need/opportunity in Zion National Park. Plans are underway to implement a demonstration project in FY 1999 which will address the conservation needs of the Park, with visible results to thousands of visitors each year.

In FY 1999, the LCRA will continue to contact the water users of northwestern Arizona and southern Utah in an effort to provide additional conservation planning assistance, further develop the information and education programs in place, and search for new projects and activities which demonstrate innovative technology and effective efficiency measures.

Colorado River Water Users

Water users within the LCRA who have water service contracts with the Secretary of the Interior include the following:

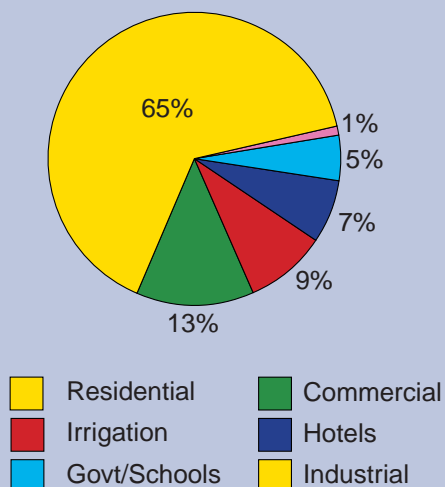
Nevada:

- ◆ Basic Management/Basic Water Company
- ◆ Big Bend Water District
- ◆ Boulder Canyon Project
- ◆ City of Boulder City
- ◆ City of Henderson
- ◆ City of North Las Vegas
- ◆ City of Las Vegas
- ◆ Colorado River Commission of Nevada (Robert B. Griffith Water Project)
- ◆ Las Vegas Valley Water District
- ◆ National Park Service
- ◆ Nevada Department of Fish and Game
- ◆ Nellis Air Force Base
- ◆ Pacific Coast Building Products (PABCO Gypsum)
- ◆ Southern California Edison Company
- ◆ Southern Nevada Water Authority (SNWA)

In Arizona:

- ◆ Boy Scouts of America
- ◆ Bureau of Land Management
- ◆ City of Bullhead City
- ◆ City of Kingman
- ◆ City of Lake Havasu City
- ◆ City of Parker
- ◆ Golden Standard Mines
- ◆ Havasu Water Company
- ◆ Lake Havasu Irrigation and Drainage District
- ◆ Marble Canyon
- ◆ McAlister
- ◆ Mohave County
- ◆ Mohave County Water Authority
- ◆ Mohave Water Conservation District
- ◆ National Park Service
- ◆ Western States Minerals

In California: City of Needles

Southern Nevada Water Uses**Foundation for Conservation in Southern Nevada.**

Figures compiled by the SNWA show the following breakdown for urban usage in southern Nevada:

SNWA has a variety of incentive and retrofit programs in place to address the above mentioned categories of water users with the goal of reducing overall water consumption in southern Nevada. These programs will be discussed in more detail under Common and New Measures Employed by Districts.

Emphasized Activities

The most immediate conservation needs of the LCRA lie within southern Nevada. Activities to be emphasized to address the needs of southern Nevada will revolve around urban uses (that is, incentive and retrofit programs; information and education activities; and commercial, industrial, and institutional audits). We will continue to work with the SNWA to minimize water consumption through adoption of its comprehensive conservation plan (a collective effort among the seven member agencies) and providing technical and/or financial assistance, as needed, to implement the SNWA's conservation plan measures (BMP's). SNWA's BMP's are discussed in more detail under Common and New Measures Employed by Districts.

Secondary emphasis will be placed on developing partnerships with the users of Arizona and Utah in order to provide technical and/or financial assistance to meet the respective needs of their areas. Since most of the water use in northwestern Arizona and southern Utah consists of tributary flows of the Colorado River and not direct diversion, it is anticipated that their conservation needs and opportunities are much different than southern Nevada's needs and

opportunities. In other words, the populations of the Arizona and Utah communities are much smaller, placing fewer demands on their water supplies; therefore, the existing opportunities and efforts made for conservation in northwestern Arizona and southern Utah will probably be on a smaller scale than the efforts made for conservation issues in southern Nevada.

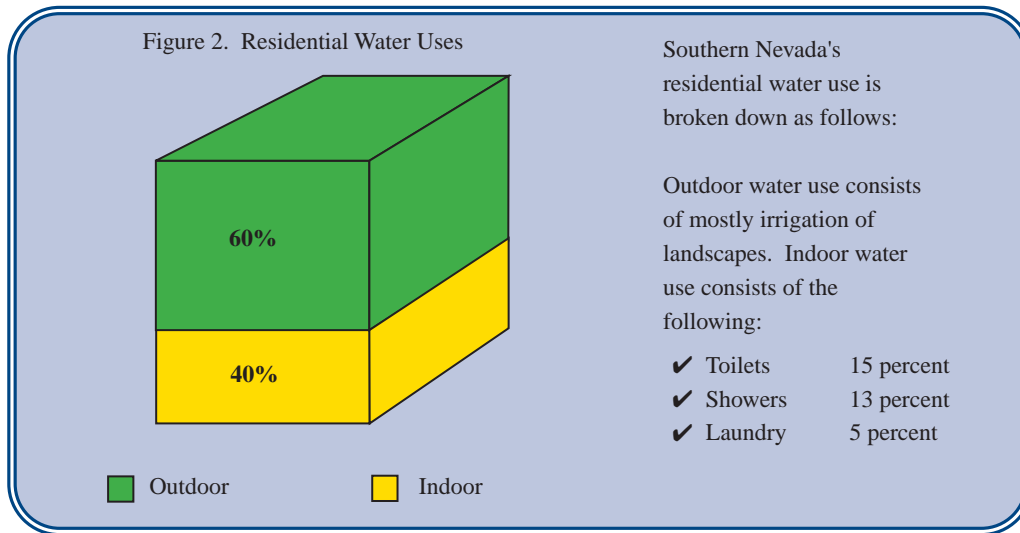
PROGRAM ACCOMPLISHMENTS

In FY 1998, the LCRA achieved nearly all of its goals with respect to conservation planning assistance, demonstration of innovative technologies, implementation of effective efficiency measures, and information and education activities. Specific measures were identified and implemented to support achievement of FY 1998 LCRA goals in the following areas:

Conservation Planning Assistance

Goal 1: Ensure all users within LCRA submit sound conservation plans in a timely manner.

Measure: Workshops, monthly meetings with SNWA and its member agencies, one-on-one meetings, frequent telephone inquiries, LCRA newsletter, and correspondence with users. Have met



with all 32 LCRA users via workshops and provided WCFSP program requirements, M&I plan guidelines, and computer models for submission of plans. In addition, the LCRA Water Conservation Coordinator participated in monthly work group meetings with SNWA and representatives of its member agencies. The LCRA provided technical assistance on an as-needed basis with other users in the process of developing and implementing plans. We offered financial assistance to two industrial users to conduct a commercial, industrial, and institutional audit.

LCRA users met FY 1998 to provide technical assistance included SNWA member agencies, the City of Boulder City, Pacific Coast Building Products, Basic Management/Basic Water Company, the National Park Service, the City of Lake Havasu, and the City of Needles. Discussions with these users have included evaluation of existing water conservation plans and measures, evaluation of ways to improve the information in the plans to help manage and budget for water conservation efforts, identification of opportunities for conservation improvements, and facilitation of partnership efforts. These discussions have also stressed the importance of plans' content and how the content of plans translates into success stories for the districts namely, plans need to include goals, measures for implementation, and a time schedule for completion in order to enable plans to work for the districts.

All LCRA conservation plans are current or are being developed as scheduled, with the exception of Basic Management/Basic Water Company (one of two industrial users within the LCRA), who has submitted a draft plan but needs to submit supplemental information before a final plan can be adopted.

Results of Goal 1: Overall goal achieved, with exception of one district who is running behind schedule with adoption of a final plan.

Other Technical Assistance

Reclamation has been providing technical assistance to the SNWA with data collection efforts for the SNWA-USBR Xeriscape Conversion Study via site reviews and consultations with a statistician from the Denver Technical Service Center and LCRA staff.

Reclamation has also provided technical assistance for planning and phasing of the NPS-USBR Landscape Conversion Study to convert irrigation systems and replace vegetation at two campground sites located within the Lake Mead National Recreation Area.

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*Demonstration of Innovative Technology/
Implementation of Effective Efficiency Measures*

Goal 2: Save 1 percent, or 3,000 AF annually, of Nevada's Colorado River allocation being used in southern Nevada by residents and commercial properties.

Measure: SNWA-USBR Xeriscape Conversion Study. The SNWA is the primary entity responsible for maintenance of conveyance facilities and administration and distribution of Colorado River water to users throughout southern Nevada. Southern Nevada has a scarce water supply, when compared to the other Lower Basin States, and has limited options for development of additional, sustainable supplies which will carry its residents well into the next century. With Nevada's hot, dry climate, about 60 percent of the water supply used by residents and commercial properties is applied outdoors for landscaping and recreational purposes. Up to 50 percent of the water applied to outdoor landscaping may be used inefficiently due to poor sprinkler system design, improper watering methods, and poorly designed landscapes.

Thus, Cooperative Agreement No. 5-FC-30-00440 was executed on August 29, 1995, to fund the SNWA-USBR Xeriscape Conversion Study. This cost-shared partnership has made a \$1.18 million investment for purposes of studying water savings by converting 550 turf landscapes to xeriscape landscaping (residential and commercial sites), with rebates offered to converted landscape participants. An additional 550 turf landscapes (residential and commercial sites) are participating in the Study through water metering evaluation. Currently in its fourth year of execution, the Study has now entered the data collection phase to evaluate the overall water savings achieved by the xeriscape group as compared to the turf group with the use of a sophisticated datalogger data collection and interpretation system. Preliminary data gathered indicates a consumptive use rate savings of between 30 and 80 percent for converted xeriscape sites.

This Study is just one of the incentive programs and BMP's (plan measures) currently in place at SNWA

which promoted the achievement of its conservation goal for summer 1998. SNWA set a conservation goal of 14.8 percent and achieved 15.0 percent conservation, or 10.5 billion gallons of water, throughout the Las Vegas valley this summer!

Results of Goal 2: Goal achieved for FY 1998; overall Study goals on track.

Goal 3: Save 164 AF/year at two National Park Service (NPS) campground sites located within the Lake Mead National Recreation Area (LMNRA).

Measure: NPS-USBR Landscape Conversion Study. The LMNRA receives more than 900,000 visitors annually. The campgrounds are flood-irrigated, and the primary vegetation in the campgrounds is mainly non-native vegetation which consumes large quantities of water.

Intra-Agency Agreement Number 8-AA-30-00034 was executed on September 25, 1998, for purposes of converting the ditch irrigation systems to drip irrigation and replacing the non-native vegetation with native, drought-tolerant vegetation at Echo Bay and Cottonwood Cove campground sites. Completion of this cost-shared Study will result in the conservation of more than 160 AF/year, or 70 percent of the current rate in consumptive use, and demonstration of efficient conservation methods to thousands of campground visitors each year.

Results of Goal 3: Goal achieved for FY 1998; overall Study goals on track.

Goal 4: Install waterless urinals at Lake Mead National Recreation Area.

Measure: Reclamation provided approximately \$5,000 to the NPS in FY 1997 to purchase 10 waterless urinals for use at the LMNRA. The urinals were installed at local campground areas in FY 1998, demonstrating this innovative and efficient technology to thousands of LMNRA visitors. Decorative plaques were installed inside the waterless urinals, indicating that the NPS and Reclamation had

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partnered in this effort to conserve water and save taxpayers' dollars while providing a valuable service to the public.

Results of Goal 4: Goal achieved.

Goal 5: Conduct a market survey of the Las Vegas valley in order to kick-off a Horizontal Washing Machine Study with the SNWA.

Measure: Assessment of SNWA's many current incentive and retrofit programs has resulted in the postponement of this goal due to funding and resource constraints. LCRA staff have held discussions with a consultant who conducts local energy market surveys for horizontal washing machine utilization. We will table this goal until FY 1999, when the possibility of implementing this incentive program in the Las Vegas valley, or with a municipal user in the northwestern Arizona area, is more viable.

Results of Goal 5: Goal postponed to FY 1999.

Information and Education Activities

Goal 6: Public awareness of water conservation in southern Nevada.

Measure: Originally, the measure to implement this goal was identified as having Reclamation become an active sponsor/participant of the Coalition 2000 group in the Las Vegas valley. This group of private industry businesses promotes grass-roots campaigns to inform the general public about water conservation methods that everyone can incorporate into their everyday lives. In FY 1998, the LCRA approached the Coalition 2000 group about becoming an active member and contributing \$5,000 towards its summer campaign. Reclamation's offer was declined; the group wants to stick with its original intent of members being comprised of private industry businesses.

In order to meet LCRA's goal of public awareness of conservation, we looked for other local opportunities. As a result, the LCRA was able to sponsor four

Project WET workshops to train Las Vegas valley teachers to teach Project WET curriculum in their own classrooms, much of which is directly related to water conservation issues. Reclamation provided \$20,000 to the State of Nevada to sponsor these workshops in the Southern Nevada Region. Southern Nevada's Project WET Coordinator retired this summer, and there is no available funding to replace the position. Sponsoring these workshops will assist the Southern Nevada Region with ensuring that the Project WET program continues to thrive in local schools.

Results of Goal 6: Goal achieved through substituted measure.

Goal 7: Public awareness of water conservation in northwestern Arizona.

Measure: Mohave County Landscape Guide. The LCRA provided \$2,500 to the University of Arizona to cover publishing costs of a landscape guide for Mohave County residents and University of Arizona workshop participants. This guide, the first of its kind to specifically address Mohave County native vegetation, contains a listing of native, drought-tolerant plant families with descriptions, planting specifications, and watering guidelines. Five thousand copies of the guide have been distributed to Mohave County residents, and the guide will be used at future University of Arizona workshops.

Results of Goal 7: Goal achieved.

Goal 8: Sponsor distribution of conservation education materials to fourth and fifth grade students in LCRA.

Measure: Water Conservation issue of Wild Outdoor World magazine. The LCRA provided \$10,000 to the Watercourse Program/Project WET to publish this November/December 1998 issue of Wild Outdoor World magazine and activity booklet, devoted entirely to the subject of water conservation. Ten thousand copies of the publication will be distributed to Project WET-participating schools in southern Nevada, southern Utah, and northwestern Arizona.

Results of Goal 8: Goal achieved.

Goal 9: Assist with development of advanced educational module for community college students.

Measure: Provide technical and financial assistance to Project WET for development of national water conservation module. Progress with the module fell behind schedule in FY 1998, so the LCRA redirected its efforts into supporting the Project WET program at a local level. The LCRA provided funding to the Southern Nevada Region to sponsor four workshops, with plans in the works to sponsor similar workshops in northwestern Arizona and southern Utah in FY 1999.

Results of Goal 9: Original module goal not met; substituted goal achieved.

Goal 10: Train local teachers in utilization of water conservation software for classroom settings.

Measure: The LCRA purchased and distributed 100 copies of the Hydroexplorer water conservation software program and instructions for use to local teachers for utilization in their classrooms. This conservation game on software is applicable for students in grades 2 through 5.

Results of Goal 10: Goal achieved.

Goal 11: Establish LCRA website.

Measure: Consultant hired to develop and establish website. The Regional Water Conservation Manager provided funding to a consultant, who established websites for each of the Area Offices located within the Region. The LCRA website address is as follows: <http://www.lc.usbr.gov/~wtr-consv>. In addition, the LCRA website has been linked to the LC-2000 Resource Management home page and will be updated on a regular basis in the future.

Results of Goal 11: Goal achieved.

Goal 12: Participate in water fair in southern Utah.

Measure: Provide presentation to 400 students at annual Washington County Water Fair. This year, the UC Region participated in the annual water fair instead of the LC Region. The LCRA hopes to be invited to this event next year. The original water fair goal was substituted with LCRA's participation in the Lower Colorado Regional Kids' Day annual event by providing a presentation and exhibits on water conservation. We provided a presentation, educational hand-outs, set up computers to access our website, and provided conservation software games for approximately 75 children.

Results of Goal 12: Original goal not achieved as UC Region invited to participate instead of LC Region. Substituted goal achieved.

Goal 13: Sponsor broad educational project for southern Nevada.

Measure: Nevada Water Education Calendar. The LCRA provided \$2,000 to sponsor one month of this calendar, published annually by the State of Nevada. The calendar is aimed at educating elementary and junior high school students on water resource management issues. Each year, the State sponsors an art contest for students with a water resource management theme. Each month of the calendar contains a photograph of a student artist with that month's sponsor, winning students' artwork, and many quizzes and facts related to water resource management issues. The LCRA distributed 500 copies of the calendar to local schools.

Results of Goal 13: Goal achieved.

Goal 14: Develop and distribute LCRA newsletter.

Measure: A newsletter was developed and distributed to all LCRA water users and other interested parties. Feedback from the newsletter has been positive; the newsletter seems to be a positive way to reinforce Reclamation's efforts and willingness to partner with local water users. At this time, the

Common and New Measures Employed by Districts

The vast majority of LCRA water users are urban. Most of the users of northwestern Arizona and southern Utah either receive tributary flows of the Colorado River or are not utilizing their Colorado River allocations. Therefore, in order to address measures utilized by districts, focus will be placed on the southern Nevada water users. Measures, or BMP's, employed by the SNWA and its member agencies in FY 1998 included the following:

- | | |
|---|---|
| ◆ Water measurement and accounting system | ◆ Commercial and industrial audit/incentive program |
| ◆ Incentive pricing and billing | ◆ Landscape programs |
| ◆ Water conservation/efficiency coordinator | ◆ Wastewater management/recycling program |
| ◆ Information and education program | ◆ Fixture replacement programs |
| ◆ Distribution system audit program | ◆ Plumbing regulations |
| ◆ Customer audit/incentive program | ◆ Water shortage contingency plan. |

Specific programs and activities are in place to support each of the BMP's. For instance, the SNWA-USBR Xeriscape Conversion Study is an activity under SNWA's landscape programs BMP.

New Activities SNWA is implement to support its measures in FY 1999:

- | | |
|---|---|
| ◆ Multifamily Plexes Retrofit Program | ◆ Commercial/Multifamily Turf Removal Program |
| ◆ Multifamily "Managing Your Green" Program | ◆ Commercial Ultra Low-Flow Toilet Rebate Program |
| ◆ Residential Turf Removal Program | ◆ Residential Early-Closure Flapper Program |

newsletter is being distributed semi-annually. As the LCRA program continues to grow and prosper in FY 1999, we will probably start distributing the newsletter quarterly.

Results of Goal 14: Goal achieved.

Efforts to Implement Effective Measures

Results of LCRA efforts to implement districts' plan measures which support plan goals have been encouraging. The LCRA has several demonstration and effective efficiency measure projects completed or underway, with more projects scheduled for

implementation or continuation in FY 1999 (see FY 1998 Goals 2, 3, and 4).

Correlation Between District Plans and LCRA Goals

The goals and measures contained in conservation plans submitted to the LCRA have been directly related to the success of the LCRA program accomplishment (see Program Accomplishments). For the past 2 years, LCRA goals have been framed around development of sound plans (conservation planning assistance); implementation of plans' goals and measures (demonstration and effective efficiency measure

projects); and development of a strong education program (information and education).

Progress with Districts in Adopting Fundamental Measures

The four fundamental measures, identified and recommended by Reclamation for inclusion in conservation plans, are (1) water measurement and accounting; (2) incentive pricing structure; (3) information and education programs; and (4) designation of water conservation contact persons. To date, all plans submitted to the LCRA for review and comment have addressed these four fundamental measures. There have been no major problems in working with districts in the LCRA to adopt the fundamental measures.

PROGRAM EVALUATION

The WCFSP in the LCRA has been in existence since October 1, 1996. The program got off to a fairly slow start in the LCRA in FY 1997. Funding for the LCRA program was initiated at \$145,000, and the dedication of 1 full FTE was devoted to LCRA program accomplishment in May 1997. The LCRA held workshops with all 32 water users in our area and started building up the program with demonstration, efficiency measure, and information and education activities to complement development and implementation of conservation plans in the area.

In FY 1998, combined WMC and EIP monies for LCRA administration totaled \$170,400. The LCRA continued to meet regularly with water users in the area to assist with development and adoption of strong conservation plans. As the fiscal year came to a close, we were on track with development of all required conservation plans, with the exception of one district. The LCRA has commitments from several water users in the area to submit and implement conservation plans even though they are not required by law to do so. We were able to continue progress or implement three demonstration and effective efficiency measure projects and sponsored nine information and education activities.

On reflection, the goals that the LCRA has set to meet the needs of local water users have been appropriate and in alignment with program resources. Plans developed and implemented, to date, have been instrumental in saving considerable quantities of water in the LCRA; results are quantifiable and measurable, as reflected in this year's and previous years' accomplishment reports and mid-year assessments.

As we move forward into our third year of program implementation in FY 1999, the LCRA will continue to focus on the four priority areas of the WCFSP: (1) conservation planning assistance; (2) demonstration of innovative technologies; (3) implementation of effective efficiency measures; and (4) information and education. The LCRA will continue meeting regularly with water users in the area to develop stronger partnerships, and we will continue to provide technical and financial assistance to water users as they develop and implement their conservation plans. We intend to continue progress on two demonstration projects (SNWA-USBR Xeriscape Conversion Study and NPS-USBR Landscape Conversion Study), with plans to implement three new demonstration and effective efficiency measure projects in FY 1999. We have two new information and educational projects scheduled for completion in FY 1999 in addition to our ongoing educational program efforts.

Progress in the LCRA, since the WCFSP was implemented in FY 1997, has been steady. The dedication of 1 full FTE to the LCRA program has been adequate to date. Funding resources for the LCRA program have been growing in small increments since the WCFSP was implemented; total funding available for the LCRA program in FY 1999 is \$279,000. However, in order to continue to meet the needs of all of the water users in the LCRA in future years, funding needs will become more paramount.

Local issues in the southern Nevada will most likely continue to be the pressing needs of the LCRA for the next several years. Where we want to go from here is to "round out" the LCRA program by working more with the water users in northwestern Arizona and southern Utah to assist in meeting the needs of all of the water users located in the LCRA.

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Phoenix Area Office

Location and Area of Responsibility

The Phoenix Area Office represents central and southeastern Arizona which encompasses the major metropolitan areas of Phoenix and Tucson, along with many rural and agricultural communities. The region is defined by the hydraulic boundary of the Gila River drainage basin in western New Mexico and extends east to Painted Rock Dam. The northern boundary includes the Bill Williams drainage basin and stretches south including the entire Gila River drainage to the international border with Mexico. The topography varies from heavily forested mountains on the Mogollon Rim to the low lying desert in the central and southern portions of the State.



Entitlement to Colorado River Water - a little history

The seven Colorado River Basin States of California, Arizona, Nevada, Utah, New Mexico, Colorado, and Wyoming and the Republic of Mexico rely on the Colorado River to meet their water supply needs. In 1922, the States entered into an interstate compact which included a provision for the equitable division and apportionment of Colorado River water.

The 1964 U.S. Supreme Court Decree in *Arizona v. California* established several additional dimensions to the apportionment of Colorado River water, including apportionments to the States of California, Arizona, and Nevada. It was ruled that of the first 7.5 million AF of mainstem water consumed in the Lower Basin, California

was entitled to a consumptive use of 4.4 million AF/year; Arizona to 2.8 million AF/year; and Nevada to 0.3 million AF/year.

The Colorado River Basin Project Act of 1968 authorized the Central Arizona Project, providing for allocations to the Lower Basin States in years of insufficient mainstream water to satisfy the specified consumptive use of 7.5 million AF/year.

In 1995, water users utilized the full 7.5 million AF/year allocation, providing all stakeholders with significant incentive for further implementation of prudent water management.

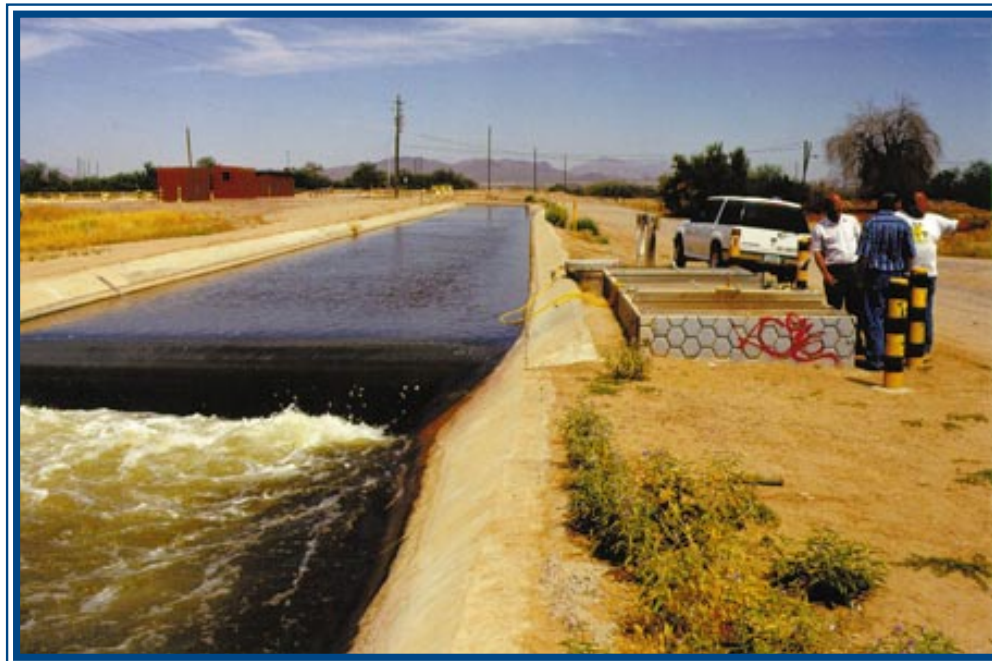
Water Supply Issues

The regional water supply is made up of three major components; surface water, groundwater, and Central Arizona Project (CAP) water. Surface water, developed predominantly by the Salt River Project on the Salt and Verde Rivers in the metropolitan Phoenix area, and CAP water have historically been used for agricultural purposes but in recent years has been converted to M&I uses. The CAP services 50 municipal and industrial (M&I) customers, ten agricultural districts and ten Native American entities. Surface water in the State is extremely limited, thus, most communities outside the CAP service area are completely dependent on groundwater. The metropolitan Tucson area, though within the CAP service area, still utilizes groundwater to meet its water needs.

Water Management Issues

Water management issues, as they pertain to the WCFSP, are many and varied. For example, the city of Tucson is the only major city in the country totally dependent upon groundwater pumping. This pumping has depleted the subsurface water to the extent that surface subsidence has become a vital issue in the area.

Because Arizona has a significant reliance on ground water, and in order to protect the resource, the State of Arizona adopted a groundwater code in 1980 which regulates pumping within certain districts, or Active Management Areas (AMA) within the State. These AMAs are defined and regulated by the Arizona Department of Water Resources (ADWR) and are located in the most populated and largest groundwater pumping areas of the State. There are currently five AMAs; Phoenix, Tucson, Pima County, Pinal County, and Prescott. Each of the 50 CAP M&I customers and ten agricultural districts are located within an AMA boundary.



CAP M&I Water Users Regulated by the State of Arizona

Arizona State Land Department	City of Goodyear	Phoenix Memorial Park Cemetery
Arizona Water Company - Apache Junction	City of Mesa	Queen Creek Water Company
Arizona Water Company - Casa Grande	City of Peoria	Rio Verde Utilities, Inc.
Arizona Water Company - Coolidge	City of Phoenix	Roosevelt Water Conservation District
Arizona Water Company - White Tank	City of Scottsdale	San Tan Irrigation District
Berneil Water Company	City of Surprise	Spanish Trail Water Co.
BHP Copper Inc.	City of Tempe	Sun City Water Company
Brooke Water L.L.C.	City of Tucson	Sunrise Water Company
Carefree Water Company, Inc.	Community Water Company of Green Valley	Town of Buckeye
Cave Creek Water Company	Del Lago Water Company	Town of Florence
Chandler Heights Citrus Irrigation District	Flowing Wells Irrigation District	Town of Gilbert
Chaparral City Water Company	Green Valley Water Company	Town of Oro Valley
Citizens Utility Company	Litchfield Park Service Company	Water Utilities Community Facility District
City of Avondale	Maricopa County Parks and Recreation	Water Utility of Great Buckeye, Inc.
City of Chandler	Midvale Farms Water Company	Water Utility of Greater Tonopah
City of Eloy	New River Utility Company	West End Water Company
City of Glendale	Paradise Valley Water Company	

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<i>CAP Non-Indian Agricultural Water Users</i>	<i>Native American Communities with CAP Allocations</i>
Central Arizona Irrigation and Drainage District	Gila River Indian Community
Chandler Heights Citrus Irrigation District	Camp Verde Yavapai Apache
Cortaro-Marana Irrigation District	Tohono O'Odham Nation
Harquahala Valley Irrigation District	Salt River Pima-Maricopa Indian Community (SRPMIC)
Hohokam Irrigation and Drainage District	Fort McDowell Indian Community
Maricopa-Stanfield Irrigation and Drainage District (MSIDD)	Ak-Chin Indian Community
New Magma Irrigation and Drainage District	Pascua Yaqui Indian Tribe
Queen Creek Irrigation District	San Carlos Apache Tribe
San Tan Irrigation District	Yavapai-Prescott Indian Tribe
Tonopah Irrigation District	Yavapai-Prescott Indian Tribe

Native American Communities

The Native American communities possess sovereign immunity and are therefore not subject to State law. To date only the Ak-Chin Indian Community is receiving CAP water pursuant to their entitlement. The tribes listed in the above table have CAP allocations, but do not have any reporting or conservation requirements imposed by the ADWR.

Issues and Opportunities

Arizona law requires that the ADWR develop a comprehensive water conservation program for each of the five AMAs. Pursuant to State law, the ADWR has developed management plans for each AMA which

provides performance based conservation standards for each water user.

After careful review of the ADWR management plans, the Regional Director has determined that the performance standards and other conservation criteria imposed by the ADWR meets the intent of Section 210(b) of the RRA. Reclamation water users

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currently reporting to the ADWR are, therefore, not required to submit a water conservation plan for review to Reclamation. This provides a unique opportunity for the PXAO to work with the State and individual water users to develop and implement conservation technologies and strong education programs which support water users in their diligence to achieve these performance based standards.

PXAO participated in the public review and comment of the ADWR's third management plan, currently being developed for each AMA. The new management plans are scheduled to take effect January 1, 2000. PXAO participated in a public forum, through the Phoenix and Tucson AMA's, in support of their Water Conservation and Augmentation programs.

The PXAO Field Services program serves two diverse purposes.

- ✓ assist water users with established plans to implement their designated measures
- ✓ work with tribes and rural communities to provide technical assistance in the development and implementation of water management plans

The PXAO Field Services program serves two diverse purposes. The first is to assist water users with established plans to implement their designated measures. The second purpose is to work with tribes and rural communities to provide technical assistance in the development and implementation of water management plans. Toward that end, PXAO has developed partnerships with the Natural Resource Conservation Service (NRCS), Natural Resources Conservation Districts (NRCD), the United States Geological Survey, ADWR, the University of Arizona (U of A), the Phoenix and Tucson AMAs, municipalities, Indian communities, regional water conservation groups, individual water users and many others to research and develop more efficient agriculture and urban water uses.

FY1998 WCFSP Goals

The 1998 WCFSP defined 6 major goals. Listed below are the goals as outlined in the PXAO Fiscal Year 1998 WCFSP and the activities by which they were accomplished (see table 6 below for a summary of each project).

Support two Active Management Areas in water conservation efforts.

Provide information to 2% of the public.

The PXAO homepage has been developed, is updated periodically and is available for users. We have provided information, brochures, and welcome packets to the Water Conservation Alliance of Southern Arizona (Water CASA) for dissemination to the public. Projects such as the Papago Greenline with the Arizona Historical Society and the Our Yard Program with the Pima County Cooperative Extension Service also received funding through the WCFSP. Additionally, we participated as a sponsor of the Tucson Children's Museum Earth Day Festival and Parade. PXAO also participates in NRCDs Board meetings and Field Days and as members of Regional Conservation Committees: Arizona Municipal Water Users Association Conservation Committee (AMWUA), Water CASA.

Coordinate the development of water management plans with two tribes.

PXAO currently has projects with the Navajo Nation and the SRPMIC.

Support two research projects.

PXAO is currently supporting two ongoing research projects: Xeriscape and Turfgrass.

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Provide assistance for 6 technical projects.

Assistance has been provided for 7 projects in FY98: SRPMIC, Neighbors Helping Neighbors, Ganado, Front Loading Washing Machine Study, St. David's School, Management Improvement Program (MIP), and NRCD.

Meet with 2 districts to promote water conservation.

PXAO provides financial assistance and participates in the MIP with the MSIDD. Attended meetings with the cities of Chandler, Glendale, Mesa, Peoria, Phoenix, Scottsdale, Tempe, Tucson; with Community Water Company of Green Valley, Flowing Wells Irrigation District, Green Valley Water Company, Town of Marana, Metro Water District; with the ten irrigation districts in conjunction with other Reclamation reviews; with the Tohono O'odham Nation, SRPMIC, San Carlos Apache Tribe, and the Navajo Nation.

Other Reclamation Programs

To date, the Water Conservation Program at PXAO has worked in conjunction with the General Planning, Wetlands and Native American Affairs Programs in an attempt to integrate all aspects of efficient water use and management. We have, however, only scratched the surface of possibilities within the PXAO. The Water Conservation Program can extend its conservation influence to several water management areas in the geographic area. Areas that can be influenced to improve water management include regional water supply management, e.g., water supply and demand management planning; wetlands establishment and management—multiple use of water; water conservation through water quality management; and water recycling in municipal and agricultural settings.

***PROGRAM ACCOMPLISHMENTS******Technical Planning Assistance***

▼ *SRPMIC* - Assist the SRPMIC in performing an as-built survey and hydraulic analysis of their distribution system. The goal is to provide a plan for and implement an effective method of measurement of the system.

▼ *Turfgrass* - Assist the U of A with a study of minimum water uses for turf.

Education

▼ *Water Conservation Program/Homepage* - Develop a well rounded water conservation program by communication with the public, developing, and maintaining a home page

▼ *Manage Improvement Program* - Support the Pinal County Area MIP. Partners include Central Arizona College, Central Arizona Project, Pima County Cooperative Extension, Farm service Agency, MSIDD, Natural Resources Conservation Service, Pinal AMA, West Pinal NRCD

▼ *Tucson Children's Museum Earthday* - Sponsor Earthday Parade and Festival.

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▼ *Papago Greenline* - Assist in developing a water conservation education exhibit at the Arizona Historical Society museum

▼ *Granado Irrigation Project* - Provide training to irrigators in the Granado Irrigation Project (Navajo Nation).

Demonstration

▼ *Our Yard* - Landscape Learning Center provides information and demonstration of desert environments climate, soils, and vegetation. Pima County Cooperative Extension Rebates

▼ *Rebates* - support the Tucson AMA with Front Loading Washing Machine Rebates Program

Implementation

▼ *Xeriscape* - Provide funding for a study titled "Investigation of the Implementation of Xeriscape" through the ADWR

▼ *Welcome Packets/Plumbing Retrofit Kits* - Through the Water CASA distribute welcome packets which includes a plumbing retrofit kit.

▼ *Neighbors Helping Neighbors* - Support the Neighbors Helping Neighbors Plumbing and Retrofit Program which targets lower income and higher usage homes.

▼ *Waterless Urinals* - Replace current urinals with waterless urinals at St. David's School.

▼ *NRCDs* - Assisting 7 Natural Resource Conservation District (NRCDs) in providing investigations of irrigation water efficiencies.

Highlighted Accomplishments

▼ Based on the exemption provided by the Regional director, all non-Indian CAP water users are in compliance with Reclamation's requirements under Section 210(b) of the RRA. Reclamation water users required to comply with the ADWR's performance based standards are working to meet those goals,

though many do not.

Consequently, municipalities are focusing on indoor and outdoor research of water saving measures, education and implementation of those measures. Agricultural districts are likewise striving to meet designated irrigation efficiencies and are dependent on research and implementation of water efficient measures.

The PXAO has therefore focused a great portion of its WCFSP toward research, education, demonstration and implementation.



▼ Some examples of regional conservation efforts for M&I outdoor uses include Water Harvesting and Xeriscape principles, including many demonstration gardens. Indoor measures include plumbing (toilet, shower head, and sink) retrofits and front loading washing machine studies. Below are three examples of M&I and agricultural projects sponsored by the PXAO's WCFSP:

▼ A goal of the WCFSP is supporting the ADWR and their respective AMAs in the development and funding of water conservation related programs including the feasibility study for rebates on purchases of horizontal axis washing machines, sponsoring Earth Day activities with a children's library, sponsoring a water conservation booth and horizontal axis washing machine at a home improvement fair.



▼ In cooperation with the Water CASA, educational pamphlets were developed for public distribution as well as water conservation replacement fixtures were distributed for home installation.

▼ PXAO is working with the SRPMIC, providing technical assistance toward the completion of an as-built survey and hydraulic analysis of their distribution system.

▼ The combined activities of the PXAO's WCFSP in Fiscal Year 1998 has resulted in a water savings of approximately 11,800 Acre Feet and providing information and technical assistance to more than 27,000 individuals

PROGRAM EVALUATION

As the PXAO WCFSP enters its third year, it is beginning to take shape and find its place in the local hierarchy. One of the most important aspects of the program is the assimilation into the already renowned water resources community. We have accomplished a great deal through the partnerships we have and are continuing to form at all levels. The 1998 WCFSP plan goals were accomplished, though not necessarily with the specific measures spelled out in the WCFSP plan. In order to meet local needs it is important that

we remain flexible while keeping our sights on our Area Office goals and the Reclamation Strategic Plan and Government Performance and Results Act (GPRA) goals.

In the accomplishment of FY1998 goals, the PXAO expended approximately \$422,000 and 1.3 FTE. With that level of involvement, a good balance of research, education, demonstration and implementation projects were achieved. The constituents of the PXAO are keenly aware of the benefits of efficient water management and because of that circumstance there are many viable water related projects from which to choose. Most of our work thus far has taken place in the metropolitan areas because those partners have the resources and background to initiate and follow through. Because of our limited resources we are destined to be supporters and not leaders in the conservation community. Unfortunately, that does not bode well for small rural communities. They most often do not have resources to implement measures though they have the need.

PROGRAM OUTLOOK

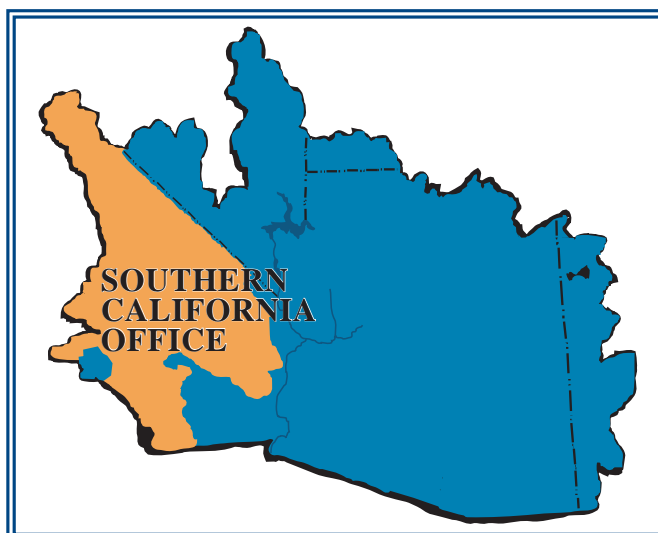
In the future, we will continue to support the large municipal and agricultural water users while also focusing support in the rural and Native American communities with technical and financial assistance in the development and implementation of efficient water management.

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Southern California Area Office

Location and Area of Responsibility

The Southern California Area Office's WCFSP is specifically committed to assisting water agencies in their development of quality water conservation plans. It is also dedicated to the implementation of the BMPs to meet the requirements of the California Urban Water Management Planning Act, as developed by the California Department of Water Resources. The Southern California Area Office (SCAO) is located in Temecula, California. Its service area encompasses all of southern California within the Lower Colorado Region with the exception of Imperial and Coachella Valleys. Situated in a desert climate without enough fresh water locally to support the population and economy, the area is dependent on imported water from northern California and the Colorado River, one of the most controversial and heavily regulated rivers in the world. Any drought induced reductions in State Water Project deliveries, as well as court-mandated reductions from the Colorado River and Eastern Sierra streams, will make it difficult to sustain a \$500 billion economy with a population growth of approximately 200,000 people annually. In addition, the Secretary of the Interior,



the Water Master of the Colorado River, has notified Californians to prepare for possible decreases in the water supply provided by the Colorado River, because of increasing demands from other Colorado River water recipients. Southern Californians are seeking ways to reduce their current use of approximately 5.2 million acre-feet back to their allotment of 4.4 million acre-feet of Colorado River water. The ongoing competition for water to serve the urban, agricultural, and environmental needs of the Lower Basin States, paired with impending reduction in Bay-Delta

California Memorandum of Understanding

In 1993, Reclamation became a signatory of the "Memorandum Of Understanding Regarding California Urban Water Conservation" (MOU). This MOU, signed by over 100 California urban water agencies, environmental organizations, and other public interest groups, established the California Urban Water Conservation Council (CUWCC) of which Reclamation is an ex-officio member. The MOU includes 16 specific best management practices (BMPs), which the signatories agree to implement according to a specific implementation schedule.

diversions, has resulted in significant uncertainties in the deliveries of firm water supplies to southern California. When coupled with the diverse and competing needs of locally developed water within the area, the



problem of providing a reliable water supply becomes even more difficult.

In addition to these rising water demands, urban water agencies are confronted with water quality issues. Surface water and groundwater supplies have been contaminated by both man-made and natural substances. The most significant threat to water quality is non-point source pollution, which may include runoff from city streets, construction sites and agricultural fields, leaking underground storage tanks, accidental spills, and abandoned mines. High total dissolved solids (TDS) from natural sources, irrigation, reservoir evaporation, and municipal and industrial discharges are also concerns for southern California's water suppliers. Pathogens such as *Giardia* and *Cryptosporidium*, and recently traces of perchlorate, an inorganic contaminant, have been detected in the Colorado River. These pathogens are of special concern because of their ability to survive in the environment for long periods of time. At the same time, protecting water quality, which may also impact water allocation, is of fundamental importance to fisheries, wildlife, and recreational interests.

Although much of the SCAO's jurisdiction is urbanized, there is a significant amount of valuable habitat. Wetlands within the area include salt marshes and estuaries, freshwater marshes, riparian woodland and a number of reservoirs and natural lakes. Vegetation is predominantly scrub lands consisting of coastal sage scrub and a number of chaparral vegetation communities. Other vegetation include oak woodland and grasslands. This diversity of vegetation types also leads to diverse wildlife species. These range

from species adapted to the coastal and marine environments to those habitating in coastal sage scrub and chaparral habitats. Marshes and riparian zones also support the diverse wildlife species. In addition, southern California encompasses the Pacific flyway and is the home of a large number of wintering waterfowl.

Societal values have evolved over the last century from an ethic of conquering nature to one of coexisting with it. This fundamental change in values combined with the passage of strict State and Federal laws protecting endangered species and their habitat, and law suits by environmental groups to enforce these laws, has impeded most conventional water development for the last two decades.

The SCAO's objectives are to encourage and facilitate water conservation and efficiency improvements on Federal and non-Federal projects and to assist agencies in meeting their demands. The SCAO's primary focus is to develop, institutionalize and deliver an incentive-based field program of direct assistance to water users for effective water management planning and implementation. Meanwhile, the WCFSP will assist Reclamation's Lower Colorado Regional Office in the facilitation and verification of reasonable, beneficial use of Colorado River water, as well as provide technical and/or financial assistance in the preparation or implementation of district plans. The SCAO has designed a program that actively promotes water conservation, assists districts with their responsibility to develop plans, and supports and complements existing State and other conservation programs.

Program Resources

In Fiscal Year 1998, a Water Conservation Specialist and a Planning Manager were hired to implement the goals of the WCFSP. Together, they actively sought public input to assist in the development of a strong water conservation program throughout southern California. It is the goal of the Water Conservation Specialist to continue the coordination effort between Reclamation and other stakeholders, lead water agencies, and other State and Federal agencies to support a progressive water conservation ethic within the

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SCAO's service area. In addition, the SCAO assisted in compensating a contractor to administer a \$3.65 million cooperative agreement between Reclamation and the Metropolitan Water District of Southern California (MWD), which has provided a wide variety of water conservation programs throughout southern California.

Funding for the WCFSP consisted of \$91,000 in Water Management and Conservation (WMC) funds and \$150,000 in Energy Incentive Program (EIP) funds for a total program of \$241,000.

Although, the WCFSP was successful this year, limited funding resources did not allow the SCAO to meet all of its stated goals. However, as the program develops, it is anticipated that the budget will increase to allow for future conservation partnering opportunities and continued success.

The WCFSP not only encourages southern Californians to use existing resources more efficiently, it also enhances and highlights many of Reclamation's on-going efforts. The SCAO has integrated water conservation with several other local Reclamation programs to complement, support and leverage an integrated water resource management strategy.



▼ Title XVI water reclamation and reuse projects (PL 102-575) are being authorized throughout the southern California region to assist water agencies in developing a reliable, local water supply.

▼ The Southern California Comprehensive Water Reclamation and Reuse Study is currently taking place to analyze the feasibility of a regional

reclamation system which will help reduce the region's reliance on water from the Colorado River.

▼ A Salinity Management Study to discover ways to reduce the salinity issues that often plague local water agencies has almost been completed.

▼ The Imperial Irrigation District and San Diego County Water Authority are presently negotiating a water transfer that would permit a long-term transfer of major quantities of water to the San Diego region. This transfer will help Californians live within their Colorado River water entitlement of 4.4 million acre-feet per year.

Program Accomplishments

The WCFSP has allowed the SCAO to build trusting, working partnerships with many of its customers. It has allowed many water agencies to embark on innovative conservation planning efforts and implement sound conservation measures. Through the WCFSP, southern California water agencies and districts have been given the opportunity to gain tremendous experience and familiarity with various aspects of planning programs, selecting and managing program contractors, tracking program costs, implementing quality assurance practices, and developing more cost-effective program designs. Equally important, the WCFSP has encouraged and promoted reliable water efficiency management and has allowed Reclamation to be recognized as an environmentally sensitive water resources manager.

The following are some of the key highlights from the Southern California Area Office's WCFSP for Fiscal Year 1998:

COOPERATIVE FUNDING WITH THE METROPOLITAN WATER DISTRICT OF SOUTHERN CALIFORNIA TO IMPLEMENT WATER CONSERVATION PROGRAMS

Partners: Metropolitan Water District of Southern California 45 member and sub-member agencies



This cooperative agreement has allowed a growing number of southern California water agencies to develop water conservation programs designed to reduce retail demand. The grant funding from the WCFSP has allowed many smaller agencies to implement an effective program by encouraging the hiring of staff, technical assistance and program management expertise. These programs resulted in agencies only having to fund 10 percent of program costs and allowed them to develop programs that represented cutting edge technologies that would create verifiable water savings.

As a result of the program the following accomplishments have been attained through FY 1998:

- 45 agencies managed Reclamation co-funded projects
- 66 projects were completed
- 61,511 ultra-low flush (ULF) toilets were retrofitted (including 3,189 non-residential)
- 132 landscape surveys were conducted
- 450 moisture sensors, 35 controllers, and one centralized controller installed on large landscapes



- 7 local weather stations installed to enhance water budgeting
- 256 commercial/industrial/institutional surveys completed
- 15 skilled nursing facilities retrofitted with ULF toilets and other conservation devices
- 9,450 residential surveys conducted
- 6 new agencies signed the MOU



Water savings estimated at 55,000 acre-feet of water saved over project lifetime at a cost of \$162 per acre-foot.

WATER CONSERVATION PROGRAM ACTIVITIES IN SOUTHERN CALIFORNIA CITIES OF SOUTH GATE, LYNNWOOD, NORWALK, COMPTON AND OTHER SOUTH-CENTRAL LOS ANGELES AREAS.

Partners: West Basin Municipal Water District
Central Basin Municipal Water District
ADVANCE - Community-based organization
ExPERT - Community-based organization
AmeriCorp - Community-based organization

To help cities implement a variety of BMPs, funding assistance was provided to implement community-based ultra-low flow toilet direct installation programs. The program offers a rebate or sometimes free approved toilets to those residents that meet specific compliance with the U.S. Treasury and HUD guidelines. This program also incorporates an on-site

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home water audit. This approach helps promote community awareness and allows multiple levels of involvement. The program is ongoing and has been expanded to include water system leak detections.



It has been estimated that as a result of leak detection audits and subsequent system improvements, 4,000 acre-feet of water has been saved and the ULF toilet rebate program has distributed over 40,000 toilets.

MOBILE IRRIGATION WATER AND NUTRIENT MANAGEMENT LABS

Partners: SDA Natural Resources
Conservation Service
San Jacinto Basin Resource
Conservation District
Eastern Municipal
Water District

This ongoing effort allows area growers and turf managers who are referred by Cooperative Extension farm advisors, local water district officials or previous

customers, to examine poor irrigation performance, high water bills, poor crop yields or uncertainties about how to determine proper irrigation scheduling for farming or landscaping operations. Fundamental services provided by the Mobile Lab includes comprehensive field evaluations of irrigation system performance; an assessment of water use history for crops or landscape; and irrigation system scheduling. Reclamation also sponsors an annual technical conference and trade show.

Fiscal Year 1998 water savings has been calculated at nearly 300 acre-feet.

IRRIGATION MANAGEMENT MOBILE LAB

Partners: Riverside-Corona Resource
Conservation District
City of Corona
Western Municipal Water District

This mobile lab began at the end of Fiscal Year 1998 and will be conducting residential management evaluations on homes that have historically high water bills, problems with landscaping, drainage or other water related issues. The test will demonstrate how to reduce runoff and drainage water, and manage irrigation on an as needed basis. Two homeowner workshops will be given in the Fall and Spring to inform participants of the analysis. Irrigation schedules will be provided based on how much water the landscapes really need.



Homeowners will be able to reduce water waste up to 15 percent.



MOBILE IRRIGATION EVALUATION LAB

Partners: Mission Resource Conservation District
San Diego County Water Authority

The objective of this program was to evaluate the irrigation systems and irrigation practices of growers in San Diego County who are presently using Colorado River water supplied by the San Diego County Water Authority and its member agencies. The Mobile Irrigation Lab provided on-site irrigation system evaluations which included evaluating the existing irrigation system while the system is in operation and soil type analysis to determine water holding capacity and possible drainage problems. A written report will be compiled and returned to participating growers and will contain the following information: summary of the system's hydraulic performance, including the system's pressure and flow rates; emission uniformity; recommendations for improvements; detailed soil information; baseline crop water use guidelines; specification of sprinklers/emitters; and all flow/pressure data collected during the evaluation.

Fifteen evaluations were conducted and an estimated savings of 400 acre-feet of water from the Colorado River is anticipated.

WATER CONSERVATION GARDEN & LEARNING CENTER

Partners: Otay Water District
Helix Water District
Metropolitan Water District of Southern California
Cuyamaca Community College

The Water Conservation Garden Authority is designing, developing, and maintaining a water conservation garden and learning center. This project will promote reduced water consumption by demonstrating and educating the application of xeriscape methods in the design, retrofit, and maintenance of landscapes that will result in a 50% savings in landscaping consumption. Reclamation will be recognized by two educational signage entitled, "The Edible Garden Exhibit" and the "Water Alternatives Exhibit". Reclamation's logo will be embossed in a highly visible area and its contribution will be recognized in press releases, newsletters, and other promotional materials.

The Garden is expected to draw approximately 1000-2000 visitors per month and special events may draw as many as 2000 or more visitors in a single day or over a weekend.

RESIDENTIAL OUTDOOR MOISTURE SENSOR PROGRAM

Partner: Southern California Water Company



As a result of this program, 300 residential moisture sensors which meet BMP goal #1 have been installed. Moisture sensors were installed in residences which have an automatic sprinkler system and a minimum of 500 square feet of turf. A comparison of pre-intervention water use history to post-intervention water use history will be documented and included in the final report. Moisture sensors conserve water by not allowing a time clock to actuate control valves when water is not needed.

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It is estimated that in a single family dwelling unit, water saving for a moisture sensor is 127 gallons per day over 5 years will calculate into 213 acre-feet of water saved.

CALIFORNIA URBAN WATER CONSERVATION COUNCIL

Partners: California Urban Water Conservation Council (CUWCC)
Over 100 signatories to the MOU
California Department of Water Resources

The CUWCC was formed to participate, monitor and evaluate the implementation of water conservation practices by signatory agencies in California. CALFED is recommending the CUWCC adopt a process for endorsement or certification of water supplier compliance with the terms of the MOU as part of CALFED's Water Use Efficiency Program. The proposed certification process would serve as a basis for assuring that urban areas are implementing cost-effective water use efficiency measures. A grant has been issued to assist the CUWCC to become the key facilitator of urban water conservation planning and implementation in California.

The CUWCC and the BMP process it oversees are now central to existing and proposed State and Federal urban water conservation initiatives, including the following: CVPIA, Urban Water Management Planning, California's 4.4 Plan, and CALFED Water Use Efficiency Program.

"WATER EFFICIENT LANDSCAPE MANAGEMENT" MANUAL

Partners: Municipal Water District of Orange County
California Landscapes Contractors Association
Irvine Ranch Water District

A landscape manual titled, "Water Efficient Landscape Management: A Water Efficient Future," was designed to assist water agencies implement

BMP goal #5. It will promote landscape conservation by educating landscape contractors and homeowner association boards regarding both the financial and aesthetic benefits of water efficient landscape management. The manual will describe the benefits of water efficient landscape management to landscape contractors and their customers. It will demonstrate ways to administer landscape irrigation budgets and will be used as a marketing tool throughout California.

Approximately 10,000 copies distributed throughout southern California

CONFERENCES AND WORKSHOP PARTICIPATION

• 1998 CALIFORNIA ENVIRONTHON

Financial assistance grant to provide California youth with natural resource experiences to promote a sense of personal stewardship of the natural environment and to empower them to take responsibility for the wise use of those resources for future generations.



• 1998 INTERNATIONAL SOIL AND WATER CONSERVATION ANNUAL CONFERENCE

The SCAO sponsored this event and set up an exhibit booth to showcase Reclamation's commitment to water resources management.

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- **WATER SITE SUPERVISOR TRAINING CLASS**

The SCAO assumed costs associated with printing and assembling "Training Guide/Reference Manuals" for the one-day class.

- **SEMI-ANNUAL WATER CONSERVATION INFORMATION COMMITTEE MEETING**



In conjunction with California Department of Water Resources, Reclamation hosted the semi-annual meeting in September 1998. The two-day meeting included a tour of the San Diego Zoo to examine the water conservation practices that are being implemented there, as well as a one-day discussion of "The Role of Economics in Water Management."

In addition to the water conservation implementation strategies, the SCAO's Water Conservation Specialist has met with multiple water agencies to inform them of the technical assistance available from Reclamation's staff to encourage good water conservation planning and to inquire how Reclamation can be of assistance to them. Meetings have taken place with the California Department of Water Resources to establish criteria and evaluation processes to ensure that water agencies' efforts are not being duplicated. It has been emphasized to all agencies that good plans should include goals, measures for implementation, and an appropriate time schedule for execution. The SCAO has provided

agencies with a guidebook and computer software to help them achieve efficient water plans.

There is only one water service contract within the SCAO's jurisdiction. The contract is with the Metropolitan Water District of Southern California (MWD), however, this contract is currently administered by Reclamation's Boulder City Office. The service area of MWD includes the southern California coastal plain and extends approximately 200 miles along the Pacific ocean from the city of Oxnard to the Mexican border on the south, and it reaches 70 miles inland. The total area serviced by MWD is approximately five percent of California's land area and includes portions of Los Angeles, Orange, Riverside, San Bernardino, San Diego and Ventura counties.

It has been the SCAO's objective to provide assistance to each of these member agencies and sub-agencies. Under the California Water Code Sections 10610 of the Urban Management Planning Act, every urban water supplier providing water for municipal purposes to more than 3,000 customers or supplying more than 3,000 acre-feet of water annually must prepare and adopt an urban management plan.

Program Evaluation

Currently, the WCFSP has allowed the SCAO to embark upon new relationships with water entities throughout southern California and extend a water use efficiency ethic that reaches beyond just its water service contractor. The Water Conservation Specialist has become an active member on the Steering Committee of the CUWCC and is supportive of the development of "Urban Water Conservation Certification," which will allow the CUWCC to effectively monitor BMP implementation and exemption status of urban water suppliers throughout the state of California. The SCAO has also developed a strong working relationship with the Mid-Pacific Region's Water Conservation Coordinators and is cognizant of laws and requirements under the Central Valley Project Improvement Act. This liaison will

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help ensure that Reclamation's mission and goals are carried out in an uniform and effective manner and will help California water agencies reduce duplication of their efforts.

Since the WCFSP's inception in 1997, the SCAO's program has continued to mature. Planning efforts and integrated water resources management have become a high priority. Goals established by the SCAO's staff have included water use efficiency management strategies. These efforts ensure cooperation and success for all of the SCAO's programs.

In the SCAO's efforts to carry out Reclamation's mission, the WCFSP has been a key component to help obtain data, knowledge, and an assessment of its local customers' needs. In the upcoming years, the SCAO will continue to build strong working relationships to assist Reclamation in carrying out its goals as defined by the Government Performance Review Act (GPRA).

Annual Performance Goals fulfilled by activities scheduled to be implemented in FY 1999 for the SCAO include the following:

Strategic Plan Strategy 5: Increase Water Availability

Strategic Plan Goal: By 2002, review 100 percent of water conservation plans developed by Reclamation water users, ensure implementation of all those required by law or contract, and using incentive-based strategies, encourage implementation of all plans not required under law or contract.

Annual Performance Goal 01.05.21.99: In FY 1999, Reclamation will provide technical assistance to water districts through implementation of a WCFSP, emphasizing four categories of activities at the Area Office level: conservation, planning assistance, conservation education, demonstration of conservation technologies, and implementation of conservation measures. Specifically, Reclamation will contact at least 50 percent of water districts to offer assistance, and will provide assistance to at least 25 percent of interested water districts.

Annual Performance Goal 01.05.22.99: In FY 1999, Reclamation will review and comment on 100 percent of all plans submitted.

Annual Performance Goal 01.05.23.99: In FY 1999, Reclamation will work with partners to implement the four "fundamental" water conservation measures (water measurement; incentive pricing; education programming; and designation of conservation coordinator) through incentives.

Program Outlook

In order to implement Reclamation's goals, the SCAO's Water Conservation Specialist, will continue to actively participate on the CUWCC and assist signatories to the MOU in the development of urban water management plans and the implementation of the BMPs. This assistance may be provided in the form of technical assistance and/or financial assistance.

In addition, a water awareness campaign will be strategically implemented throughout southern California. A website and bi-annual newsletter will be developed to foster a broader communication between the SCAO and water conservation coordinators throughout the SCAO's area. It is anticipated that the website will be linked to other conservation websites to help provide as much useful information as possible and to allow for a wide variety of circulation. The SCAO will also participate in other statewide and local campaigns such as, the 1999 California Water Awareness Campaign, Environthon, and CONSERV99.

Through the WCFSP, Reclamation will continue to seek innovative technologies and methodology to integrate a sound resource management strategy with water conservation efforts which will benefit urban and agricultural users, as well as protect the environmental and recreational interests.

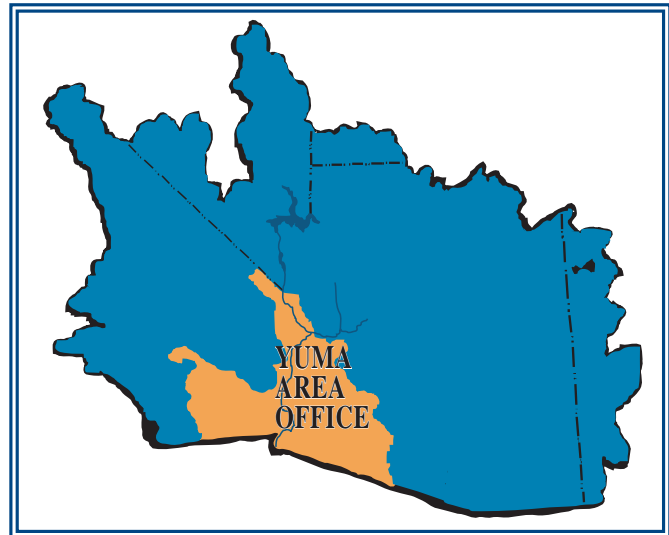
Water Conservation Field Services Program Bureau of Reclamation - Lower Colorado Region Annual Report

Yuma Area Office

Location and Area of Responsibility

The “Yuma Area” is an administrative area of Reclamation which includes all users of Colorado River water downstream of Davis Dam, except those served by the Central Arizona Project and the Colorado River Aqueduct. It is a predominately agricultural area, and the major consumer of Colorado River water. Nearly one million acres of cropland in the Yuma Area produce gross farm receipts between \$3 billion and \$4 billion per year.

The Yuma Area is composed of a vast and intricate network of water supply and drainage systems. We are approaching the limit of what can be justifiably done with pipes, concrete, and earthmoving. It is becoming harder and harder to make any advances in water conservation through structural measures. Most future advances in water conservation can be made through improved *water management*.



Potential Water Conservation in the Yuma Area

The Yuma Area water districts divert about 6.5 million acre-feet of water per year. About 4 million acre-feet of water per year of this total is diverted and consumed off the river with no return flows.

Conservation of this portion would result in more water being available for other uses.

The remainder, about 2.5 million acre-feet per year, is diverted with the unconsumed portion returning to the river. Excessive return flows contribute to salt loading, and make efficient scheduling of water deliveries downstream more difficult.

What is meant by “Water Management”?

Webster’s Dictionary defines “management” as the skilled handling of something; or the act of planning, directing, and controlling something in a skilled manner. Improving water management will involve educational efforts, improving skills and abilities, changing attitudes and perceptions, and application of new technology.

Water, however, will need to include some structural components, for example, measuring devices and automation equipment management is not a structural measure.

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A very modest increase in water use efficiency of 5% would result in about 200,000 acre-feet per year of additional water available for other uses, plus a net reduction in salt loading to the river of 200,000 tons of salts per year. Our practical potential exceeds even this modest goal.

It is important to note that a lot of improved water management and conservation has been accomplished without the assistance of government. Our mission is to strategically direct assistance and funds to those types of projects where government can be a catalyst and make the most impact.

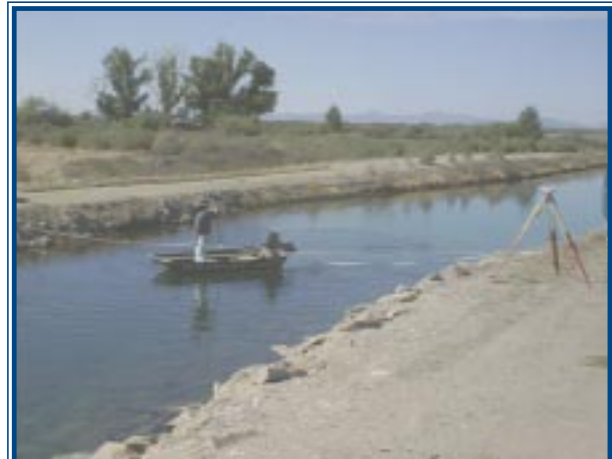
What is Reclamation Trying to Do With the Field Services Program in the Yuma Area?

Conservation Plans

All districts and municipalities over certain minimum sizes, except Indian Reservations, are required by law to prepare a water conservation plan every five years.

There are 13 districts in the Yuma Area that are required to complete plans. (Needles, Bullhead City, and Lake Havasu City work with the Lower Colorado Regional Area). In addition, there are four Indian Tribes and several smaller municipalities in the Yuma area that are not required to prepare plans.

A genuine planning effort involves gathering basic resource inventory information; identifying problems, goals, and opportunities through public discourse; and evaluating and selecting alternative courses of action through public discourse. Our goal is to work with Districts and Indian Tribes to develop genuine water conservation plans.



Flow measurement data is retrieved in a lateral.

Cooperative Conservation Projects

Our goal is to be actively working in partnership with local agencies on a well balanced water management and conservation program, with emphasis on:

- * Conservation Planning
- * Information and education
- * Demonstration of Innovative technology
- * Effective Efficiency Measures
- * Water Measurement

Why should a district or water user try to improve their water management?

For the user, it pays. In the increasingly competitive agricultural marketplace, more efficient water use will provide the edge that agricultural producers will need to prosper. Inefficiently managed water costs the user not only in water fees, but labor cost, yields, crop uniformity and fertilizer.

For the water district, more efficiently managed water reduces drainage costs and overall operating expense, while providing better service to its customers.

Let's not forget that our water supply is not unlimited. Demands for Colorado River water exceed its long term ability to supply. All water districts and agencies with foresight are going to have to demonstrate that their water use is prudent and reasonable -- that conservation measures which can be economically justified have been taken. The best way to do this is with a genuine, credible water conservation plan.

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- * Irrigation Water Management
- * Canal Automation
- * Soil Salinity Management
- * Conservation Education; and
- * Water Management & Conservation Planning.

Public Direction of Program

We want water management and conservation efforts to be responsive to local concerns. We have striven to obtain input from local water users and conservation organizations. A community advisory group, composed of stakeholders in water conservation efforts, is a good way to insure that we are doing the best job of responding to local concerns. Attending regular meetings of stakeholder groups also maintains open, informal communication.

Our goal is to accelerate public involvement in the direction of the Field Services program through community advisory groups and open communication.

What kind of effort and resources have been put into the Field Services Program in the Yuma Area?

The Field Services Program throughout the West is two years old. However, it got off to an early start in the Yuma Area, through Reclamation's unique respon-

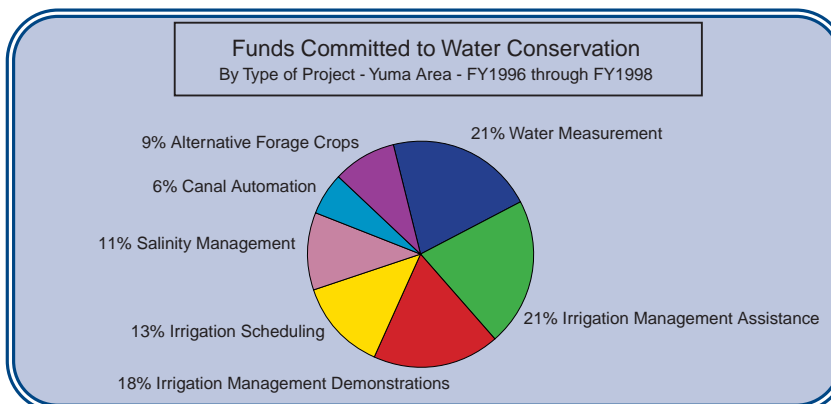
sibility as watermaster of the Lower Colorado River. So, through three years in the Yuma Area, Reclamation has committed about \$1 million to water management and conservation projects. All of these obligations are at least matched by local funds, so local obligations have likewise exceeded \$1 million. To date, expenditures have been about \$200,000, so we are just getting started. Obligations have been equally split between California and Arizona.

Our efforts and so far have been well balanced by type of project and by sponsor. Staff time devoted to water conservation efforts has risen from less than one employee-year in 1996, to 2.4 employee-years in 1998.



Studies and demonstrations of improved irrigation water management will provide good information for water users to improve their irrigation efficiency.

What did we do with the Field Services Program in 1998 and what kind of results did we see?



We are building the foundation for an effective water conservation effort through improved management. This must be long-term process with a long-term strategy. This is the approach that must be taken when dealing with management measures, as opposed to structural measures. Gone are the "easy" days, when lining a canal, for instance, could produce a discrete and easily quantifiable amount of saved water.

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A long-term strategy must include the building of a solid foundation. Our water conservation efforts in 1998 included:



Part of an irrigation evaluation by a mobile lab, is measurement the output and uniformity of undertree sprayers

Conservation Planning

We provided assistance directly to Districts in preparation of their conservation plans. In general, the largest Districts do not require any assistance beyond general policy guidance. Mid-size Districts are being assisted by providing data and information as requested. With smaller Districts, we are assisting them to collect and present data for their use in selecting alternatives. All 13 Districts have been assisted or offered assistance with their plans.



USBR partners in the establishment of weather stations for improved irrigation water management.

Conservation Education

We were partial sponsors of three “mobile labs” which provide assistance directly to farmers with evaluation of their irrigation management.

We began the formation of our first advisory group with emphasis on water management and conservation education.

We demonstrated water measurement techniques to local schools and Districts with our portable water demonstration model, and displayed it at county fairs.



Installation of an automatic controller on a main canal gate.

Demonstration of New Technology and Innovative Techniques

We were involved with two irrigation water management demonstrations with emphasis on improved management of surface irrigation systems. We developed and obligated funds for two additional demonstrations in 1998.

We continued to work with the University of Arizona to develop and Internet-based irrigation scheduling program.

We signed two cooperative agreements to demonstrate new technology for assessment and diagnosis of soil salinity, and worked with sponsors to develop another local demonstration of salinity assessment.

WATER CONSERVATION FIELD SERVICES PROGRAM YUMA AREA OFFICE WATER CONSERVATION AGREEMENTS

Entity	Subject	Entity	Subject
University of California, Holtville Station	Runoff Reduction and Irrigation Demonstration - Imperial Valley.	Yuma-Mesa Irrigation & Drainage District	Irrigation Management Service & No-rust slide gate demonstration
Coachella Resource Conservation District	Mobile Lab for irrigation evaluations	Parker Valley Conservation District.	Mobile Lab for irrigation evaluations and education
Wellton-Mohawk Conservation District	Arizona Meteorological Service Station	Palo Verde Conservation District	Irrigation water management program
Bard Water District	Water measurement demonstration	Unit "B" Irrigation and Drainage District	Low-cost canal automation demonstration
Yuma County Water Users' Association	Water measurement improvement & demonstration	Mohave Valley Irrigation and Drainage District	Water measurement improvement and demonstration
University of California Cooperative Extension, Palo Verde	Alfalfa drydown study	University of Arizona , Yuma Agricultural Center	Salinity assessment and diagnosis, demonstration of new technology
Coachella Valley Water District	3 CIMIS (California Irrigation Management Information Service) Stations	University of Arizona, Yuma Agricultural Center	Irrigation water management study & demonstration, with alfalfa
Palo Verde Irrigation District (PVID)	CIMIS Station	California Department of Water Resources	CIMIS Station, Ripley, Palo Verde Valley.
Coachella Valley Water District (CVWD)	Partnership agreement - water use survey parts of agreement	Coachella Valley Resource Conservation District	Salinity assessment and diagnosis, demonstration of new technology
University of Arizona, Yuma Agricultural Center	Irrigation water management study & demonstration for citrus on the Yuma-Mesa land-form.	University of California Cooperative Extension	Alternative forage crop demonstration at Holtville & Palo Verde (some testing in Arizona)
Colorado River Indian Tribes	Water measurement improvement & demonstration; and installation of SCADA & automation	University of Arizona, Yuma Agricultural Center	Yuma & Wellton-Mohawk Valleys Irrigation Water Management Study & Demonstration.
Bard Water District	Canal automation demonstration	Yuma Irrigation District	Canal automation demonstration
Unit "B" Irrigation & Drainage District	Water measurement improvement and demonstration.	University Of Arizona, Maricopa Center	AZSCHED (Arizona Irrigation Scheduling) computer program for Internet

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We signed a cooperative agreement with the University of California to conduct a study and demonstration of alternative forage crops that will provide an economic alternative to farmers while conserving water.

Implementation of Conservation Measures

We provided technical and financial assistance to four Districts with ongoing water measurement improvement projects, and developed an agreement for a fifth project. About thirty new long-throated flumes were installed in the Yuma Area with Field Services Program assistance, in main canals, laterals, and farm turnouts.

We developed two new canal automation demonstration project agreements, and modified two existing agreements. A demonstration of new, low-cost technology for remote monitoring of canal levels was developed. We provided direct assistance to install a SCADA network on the Colorado River Indian Reservation system.